2.2 ENVIRONMENTAL CONTEXT

This section, entitled environmental context, describes existing environmental conditions within the Central Arizona Regional Framework Study Area, and identifies potential environmental concerns for future planning and development of new transportation corridors within the study area. Information presented in this environmental context is based on existing data sources from local, county, state, and federal agencies. This background information presented in this chapter may serve as input to analyze the feasibility of roadway improvements or new roadway corridors within the study area.

This chapter describes the existing natural environment within the study area in terms of geology, topography, hydrological resources, natural infrastructure (wildlife, sensitive species, and vegetation), cultural resources, air quality, and hazardous materials. Noise quality is not addressed within this study. Noise issues will be addressed as plans are developed for future site-specific projects during their design phase. Visual surveys to confirm the characteristics of the existing natural environment have not been conducted for the Central Framework Study Area, but will be required for future proposed projects prior to implementation.

2.2.1 Geology and Topography

The Central Arizona Regional Framework Study Area lies within two major physiographic provinces of Arizona—the Basin and Range Province and the Central Highlands Province (Chronic, 2006). Both physiographic provinces are identified by distinctive landscapes and geologic characteristics. The majority of the Central Framework Study Area lies within the Basin and Range Province (a broad area of low-elevation basins), alluvial fans (sediment deposited by flowing water), and bajadas (shallow slopes that lie at the base of rocky hills) divided by mountain ranges that extend over the southern and western portions of the state. Topography of the Basin and Range Province is characterized by low, flat deserts with small interjecting mountains. The northeastern corner of the Central Arizona Regional Framework Study Area lies within the Central Highlands Province, a transitional zone of high, closely spaced mountains with shallow, narrow valleys that extend from the east-central to the west-central portion of the state. Topography of the Central Highlands Province is characterized by shallow basins and terraces with high mountain ranges.

Mountains of Arizona formed over 1,700 million years ago as tectonic plates collided, pushing up the earth's crust. Both provinces in the study area display mountains and rocks from this period and are composed of gneiss, a coarse-grained metamorphic rock, and schist, a metamorphic rock with mica flakes (Chronic, 2006). As time progressed volcanic activity occurred along these collision zones and added granite masses to the mountain ranges from the molten magma. Additionally, sedimentary deposits including marine sandstone, siltstone, and limestone, were laid throughout the area from an ancient sea (Chronic, 2006). Weathering and erosion eventually altered and reshaped the mountain ranges and created terraces, valleys, basins, and developed massive, alluvial fans and sediment deposits of sand, gravel, and cobbles which currently exists in the study area today. Unique characteristics of the Highlands Province that distinguish it from the Basin and Range Province include terraces and small shallow valleys that contain fine lake silt, lake limestone, volcanic ash deposits, salt and gypsum deposits, and a concentration of mammalian fossils from the Pliocene and Pleistocene epochs (Chronic, 2006).